

**Bureau of Land Management
Wyoming High Desert District
Fire Management Program**

**Hydrogen Sulfide Gas
Guide
2016**



**USDI Bureau of Land Management
Rock Springs Field Office
Rock Springs, WY**

**USDI Bureau of Land Management
Kemmerer Field Office
Kemmerer, WY**

**USDI Bureau of Land Management
Pinedale Field Office
Pinedale, WY**

**USDI Bureau of Land Management
Rawlins Field Office
Rawlins, WY**

Hydrogen Sulfide Gas

H₂S gas

Throughout the WY-HDD there are many localities that have developed oil and gas sites. Some of these sites have been identified to contain high levels/concentrations of H₂S gas. Hydrogen sulfide (H₂S) is a highly toxic and flammable gas. Being heavier than air, it tends to accumulate at the bottom of poorly ventilated areas. Although very pungent at first, it quickly deadens the sense of smell, so potential victims may be unaware of its presence until it's too late.

The locations with high concentrations (dangerous levels) have been mapped and are provided below. Under no circumstances will any individuals engage in wildfire operations, in areas known to contain high levels of H₂S gas. It is imperative to take all precautionary measures necessary to not expose yourself or anyone else to an area that contains H₂S gas. If you are dispatched to an incident that has a H₂S gas site in the vicinity, dispatch will notify you of the hazard.

The Basics

- H₂S gas is heavier than air and will settle in low spots or depressions.
- H₂S gas is a highly toxic and colorless gas when inhaled in areas with high concentrations it can cause almost immediate death
- If you suspect or know you have been exposed to H₂S gas, if at all possible leave the area and travel upwind and try to get the highest point possible.
- When H₂S produces the Sulfur Dioxide. Sulfur Dioxide is poisonous.
- H₂S gas is highly flammable.
- Exposure to lower concentrations can result in eye irritation, a sore throat and cough, nausea, shortness of breath, and fluid in the lungs.

Exposure Rates Parts Per Million (PPM)

- 0.0047 ppm is the recognition threshold, the concentration at which 50% of humans can detect the characteristic odor of hydrogen sulfide, normally described as resembling "a rotten egg"
- Less than 10 ppm has an exposure limit of 8 hours per day.
- 10–20 ppm is the borderline concentration for eye irritation.
- 50–100 ppm leads to eye damage.
- At 100–150 ppm the olfactory nerve is paralyzed after a few inhalations, and the sense of smell disappears, often together with awareness of danger.
- 320–530 ppm leads to pulmonary edema with the possibility of death.
- 530–1000 ppm causes strong stimulation of the central nervous system and rapid breathing, leading to loss of breathing.
- 800 ppm is the lethal concentration for 50% of humans for 5 minutes exposure.
- Concentrations over 1000 ppm cause immediate collapse with loss of breathing, even after inhalation of a single breath.

Just don't go into known areas containing H₂S gas

Dispatch Procedures in known H2S areas

Introduction: The High Desert District has one of the most active Oil and Gas leasing programs in the BLM. Additionally the nation's largest helium production facility is found on the district. Oil and Gas facilities are found on both private and BLM managed lands within southern Wyoming. These activities receive federal oversight by Petroleum Engineering Technicians (PET's) which work out of every field office. Incidents occurring on, near or threatening Oil and Gas production facilities requires coordination with the PET's. Wildfires can be caused by production equipment. H2S is a by-product of the production process. It is a highly toxic gas, and responding resources need to know if they are heading into an area that has a H2S hazard. Refer to an H2S map for reference. **Ensuring the safety of firefighters and the public remains the number one priority in responding to incidents near Oil and Gas facilities.**

Types of Incidents: Wildfire is the most common type of incident that impacts oil and gas facilities. Wildfires may pose a danger to workers at production sites, burn facilities and equipment, cause lines to rupture, resulting in hazmat situations and general interference with production operations. Oil and gas production may also be the cause of wildland fires. From well sites struck by lightning to malfunctioning equipment or oil and gas industry vehicles throwing sparks; equipment and personnel associated with the Oil and Gas industry may become the ignition source of wildland fires. Wildland fires are not the only types of incidents involving Oil and Gas operations that RWC may become involved with. Leaks and spills, even minor ones, have the potential to be haz-mat situations and require federal involvement.

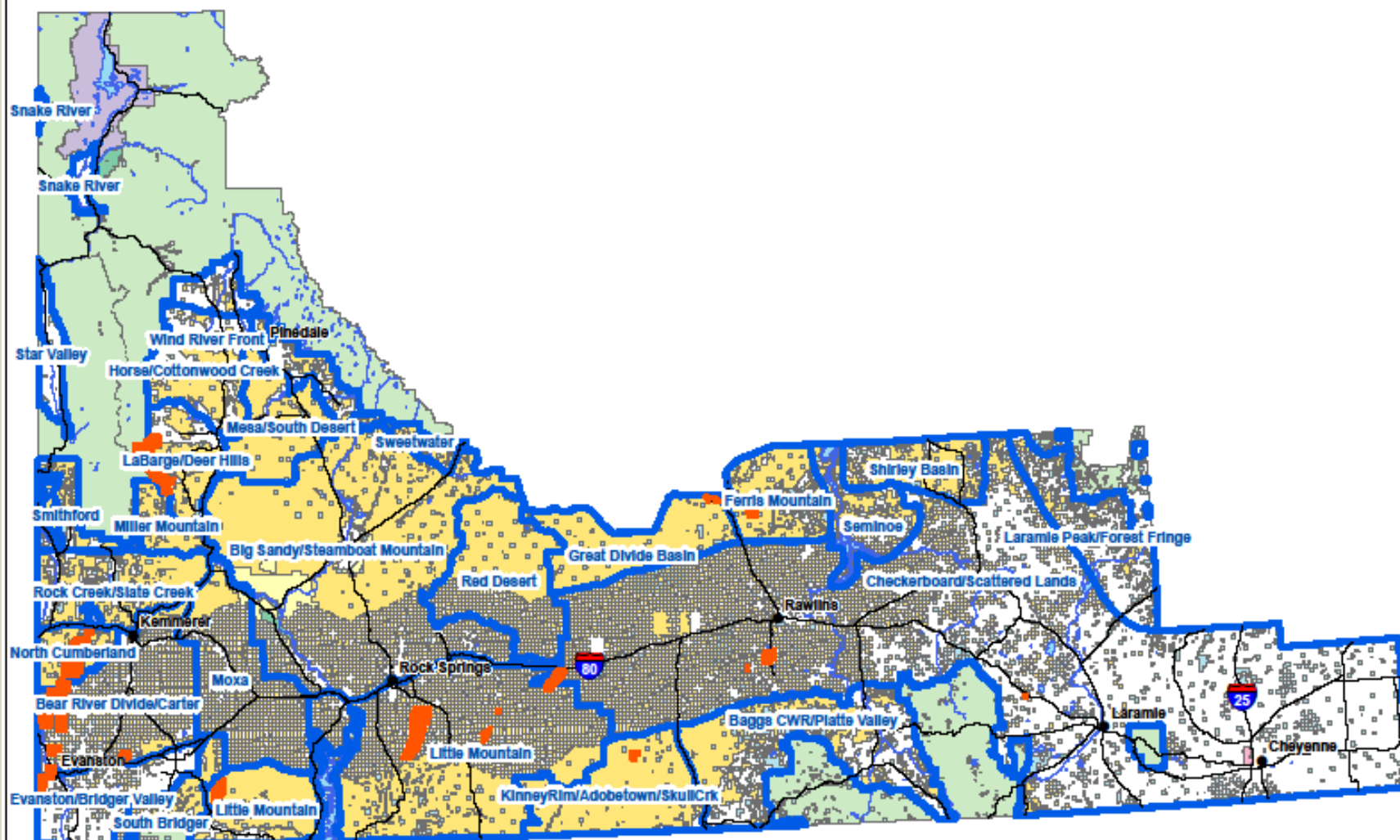
Increased vehicle activity on remote and dusty roads increases the potential for vehicle accidents, possibly with injuries; possibly resulting in wildland fires.

Response: Response to incidents near Oil and Gas operations will be conducted in accordance with established Initial Attack or other emergency policies. The only modification is that a PET from the local field office should be notified of any incident that directly affects Oil & Gas operations. A list of the PET's for each field office can be found in the Emergency Response Guide on each IA desk. If an on-call PET is established, their name and contact information will be identified in the Emergency Response Guide in the section marker Petroleum Engineers. If after hours, and no On-Call PET has been established, RWC will contact the HDD Duty Officer and request a PET. Responding resources are not to enter a potential H2S hazard area until notified that the scene is safe from either a PET or a company representative.

Well Location and Contacts: Information about wells can be obtained through the Wyoming Oil and Gas Conservation Commission at <http://wogcc.state.wy.us>. Click the Wells tab and look up the well by location, name, or API number (from the sign on the well). Once the specific information about the well is obtained, including owner and well number, a PET can contact the company to provide assistance with issues pertaining to the well.

RFO Contacts: If no On-call person is provided, Mark Lyon, a PET from the Rawlins Field Office is available to answer any questions concerning Oil and Gas operations in the Rawlins area. He can be reached at work (328-4335) or on his cell phone (307-710-2471). Prior to contacting him, ensure that no on-call PET has been established.

High Desert District Fire Management Units Hydrogen Sulfide (H2S)



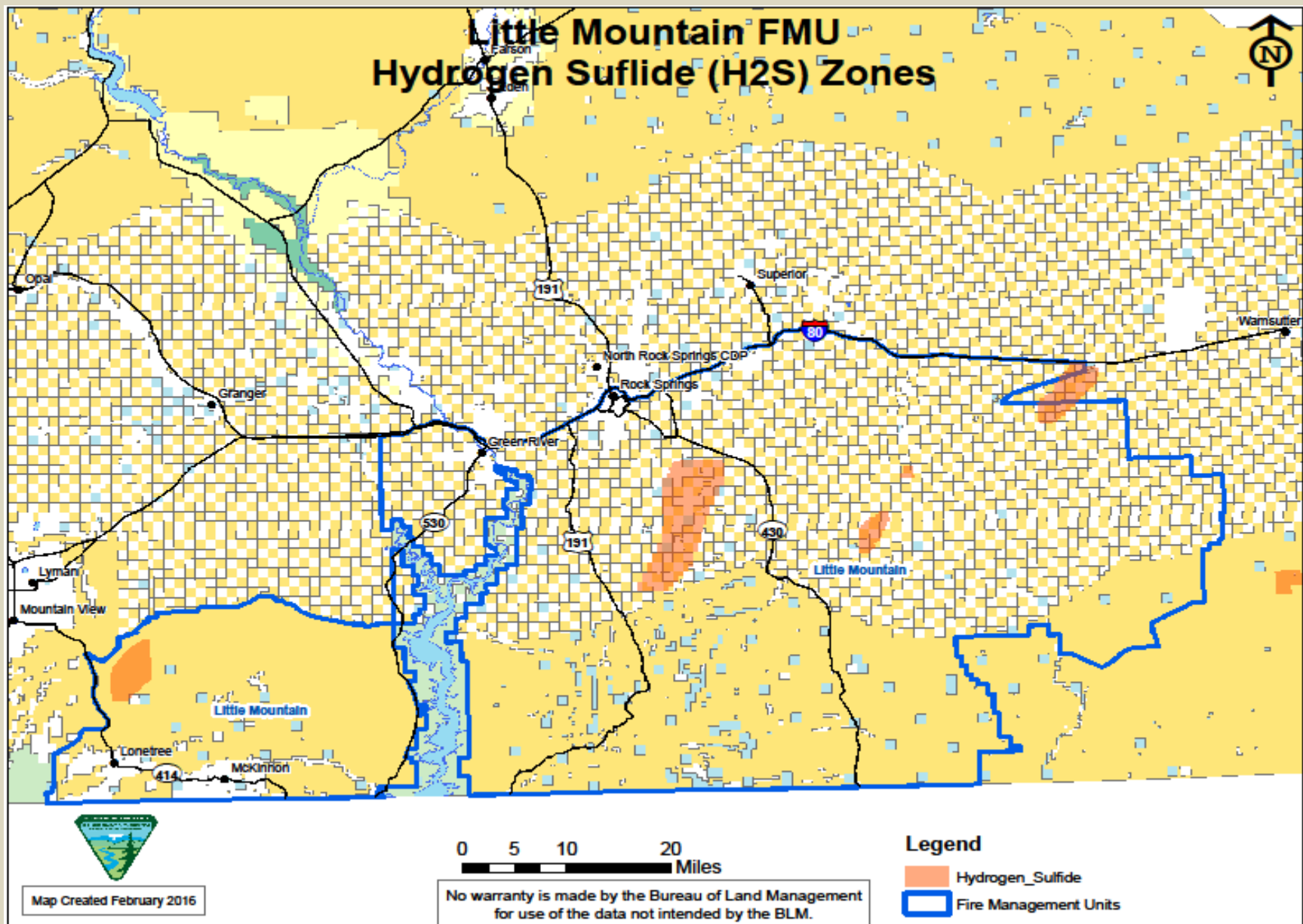
Map Created February 2016

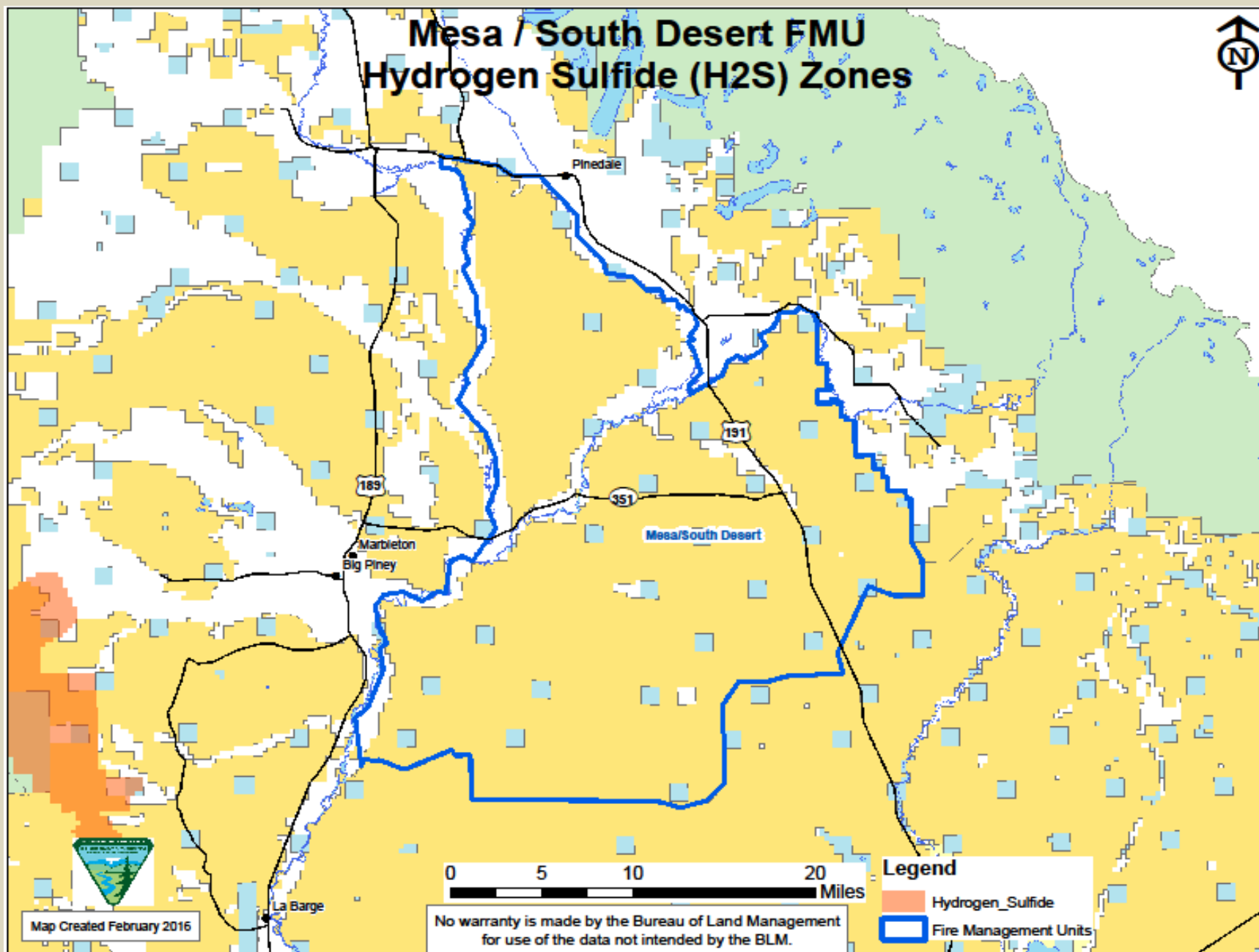
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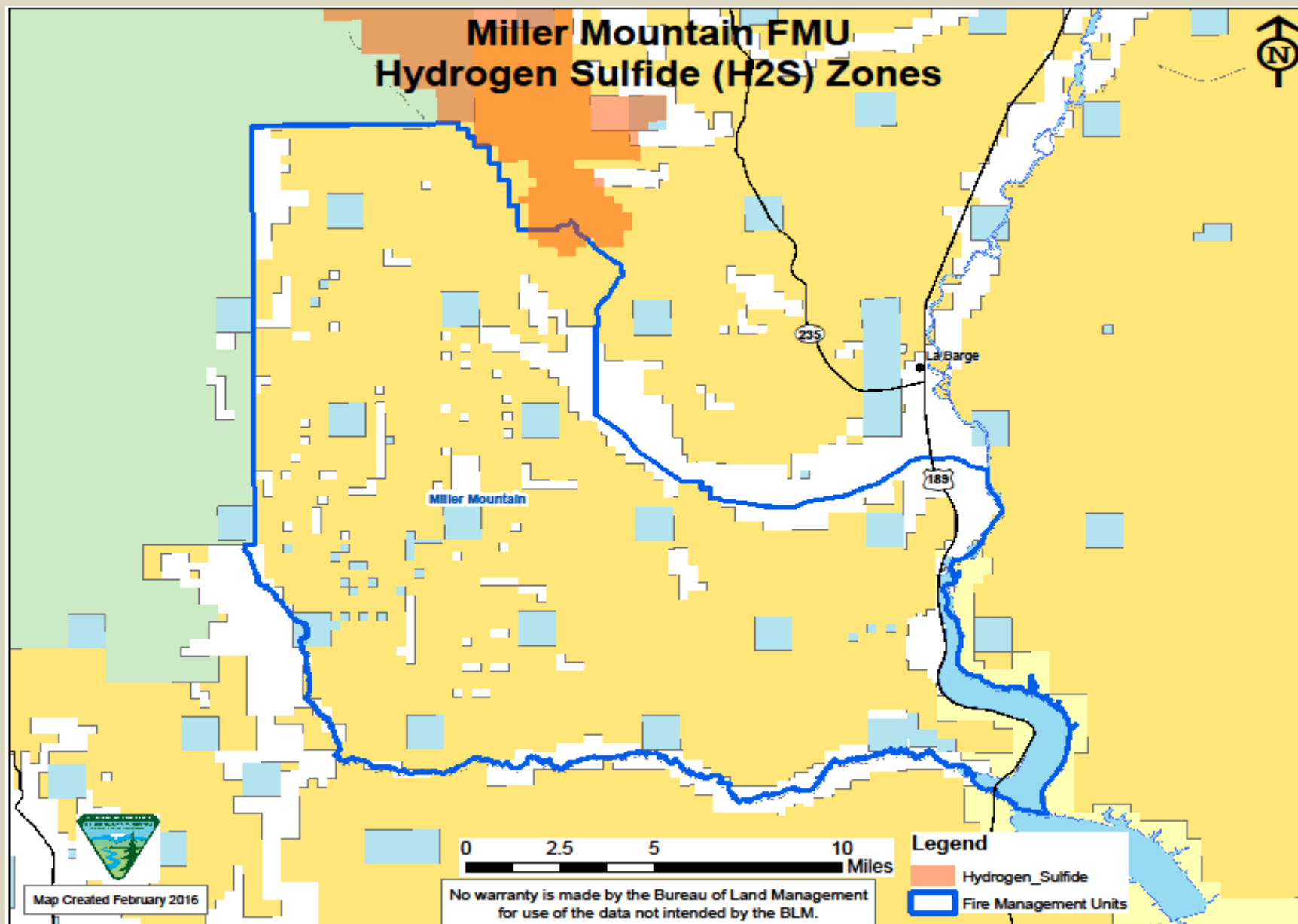
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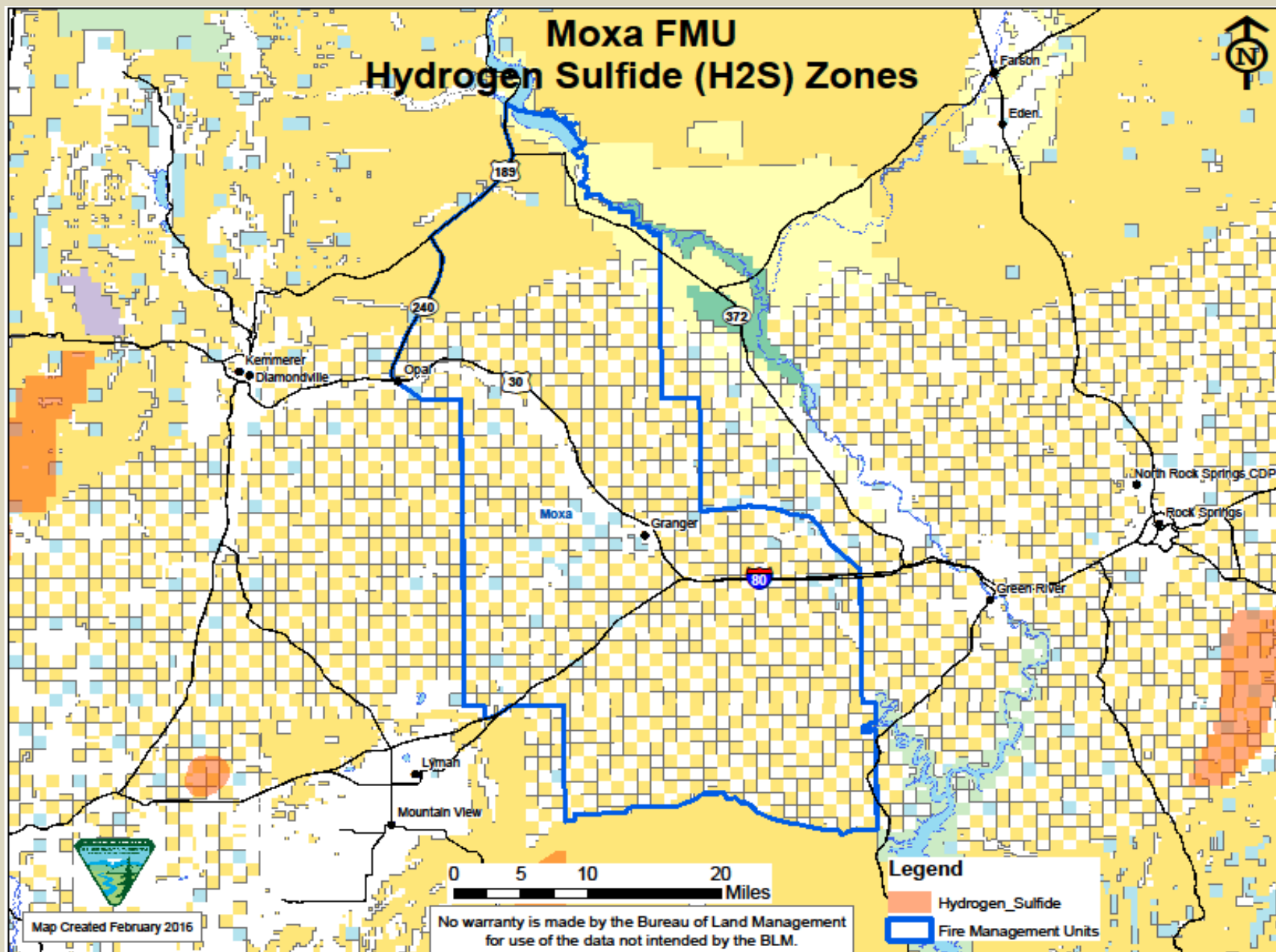
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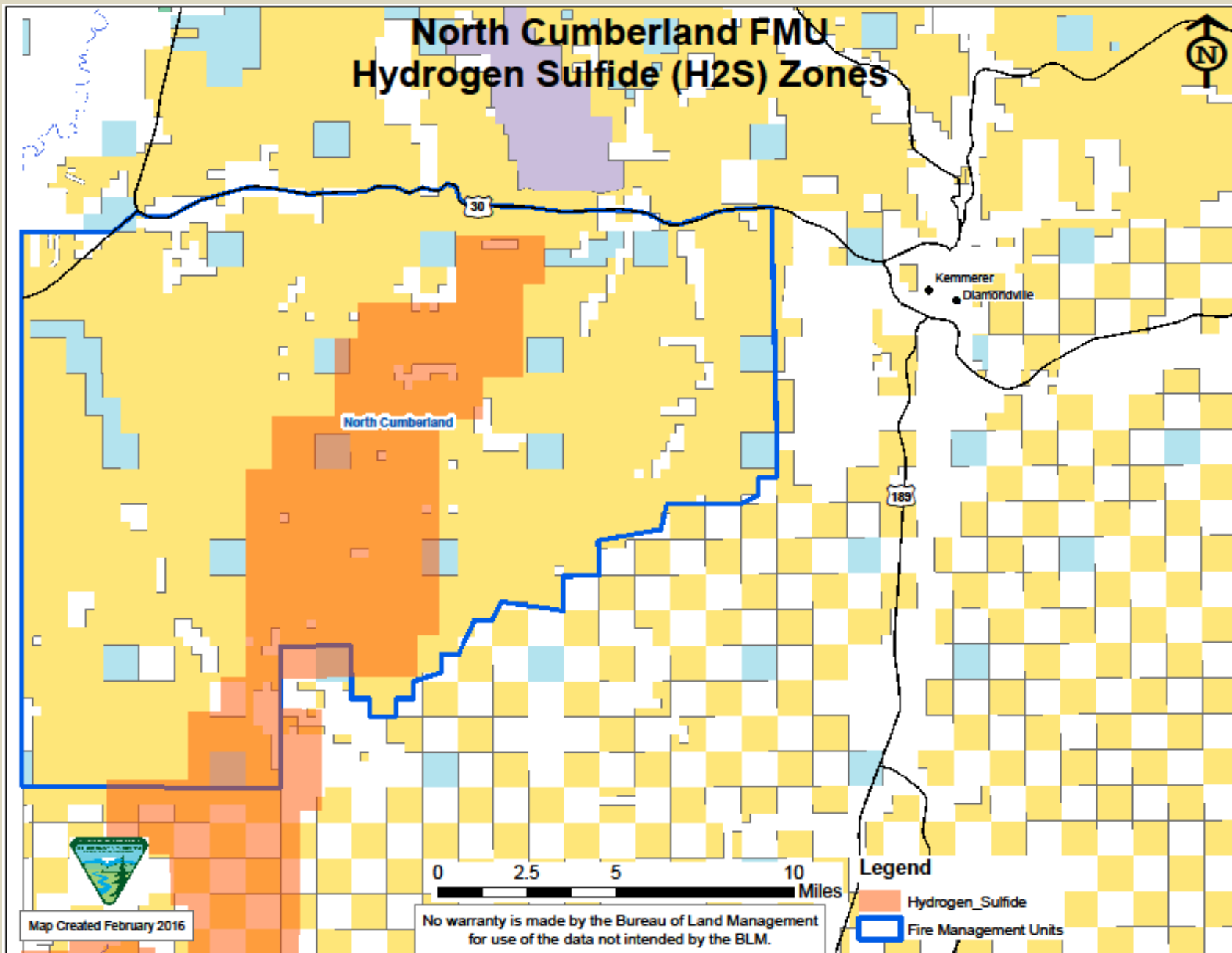
- Hydrogen Sulfide Zones
- Fire Management Units

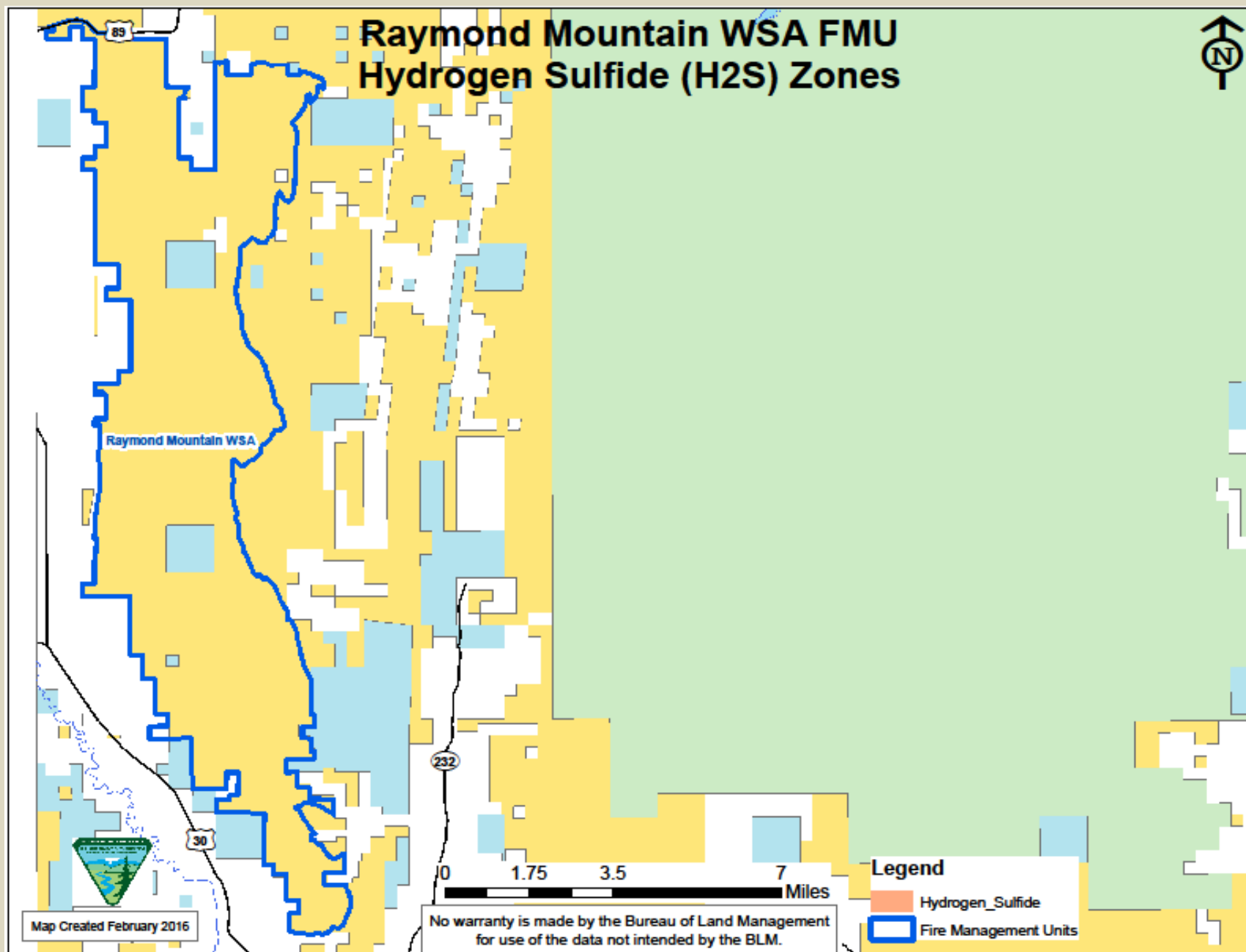


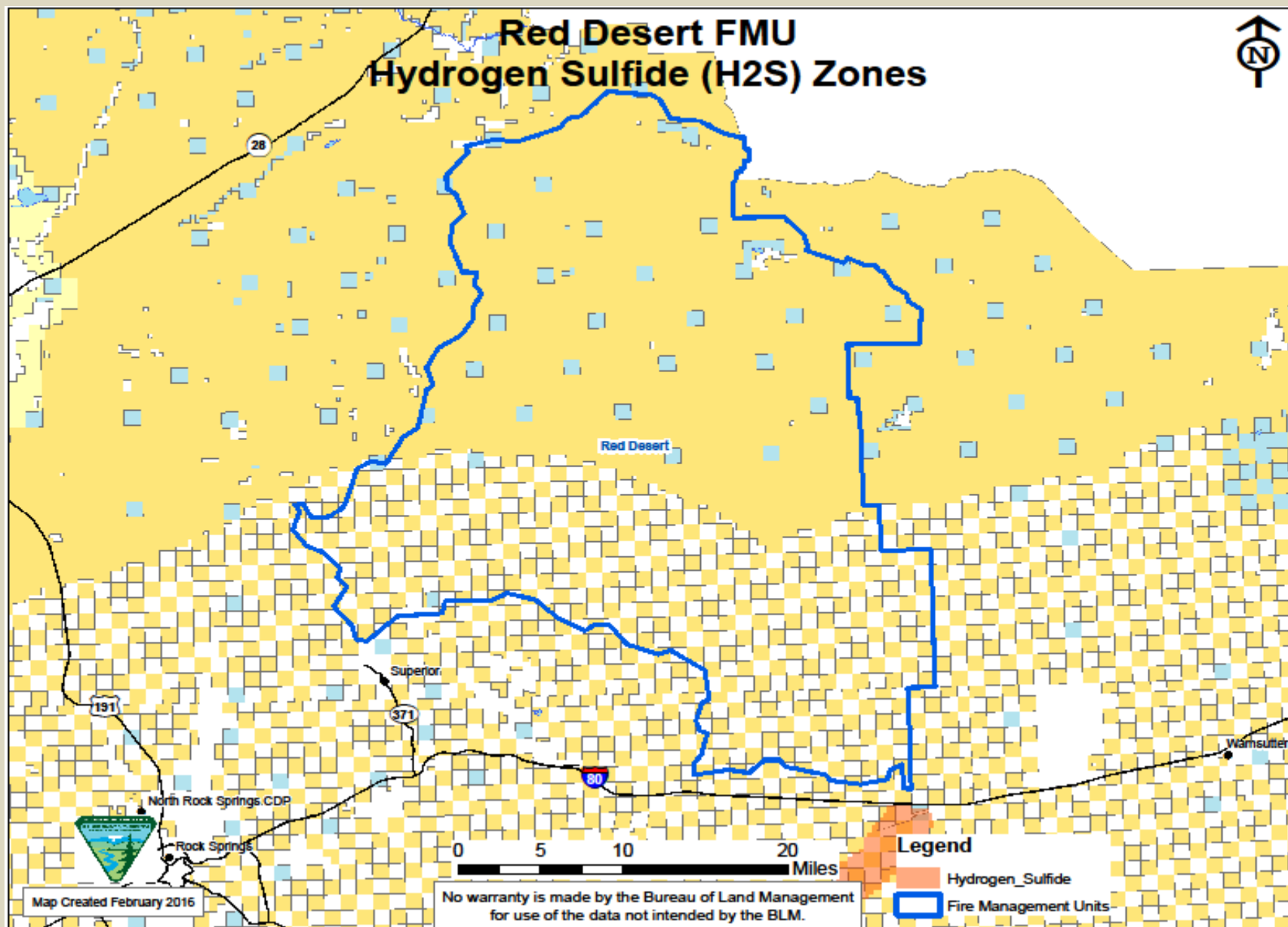


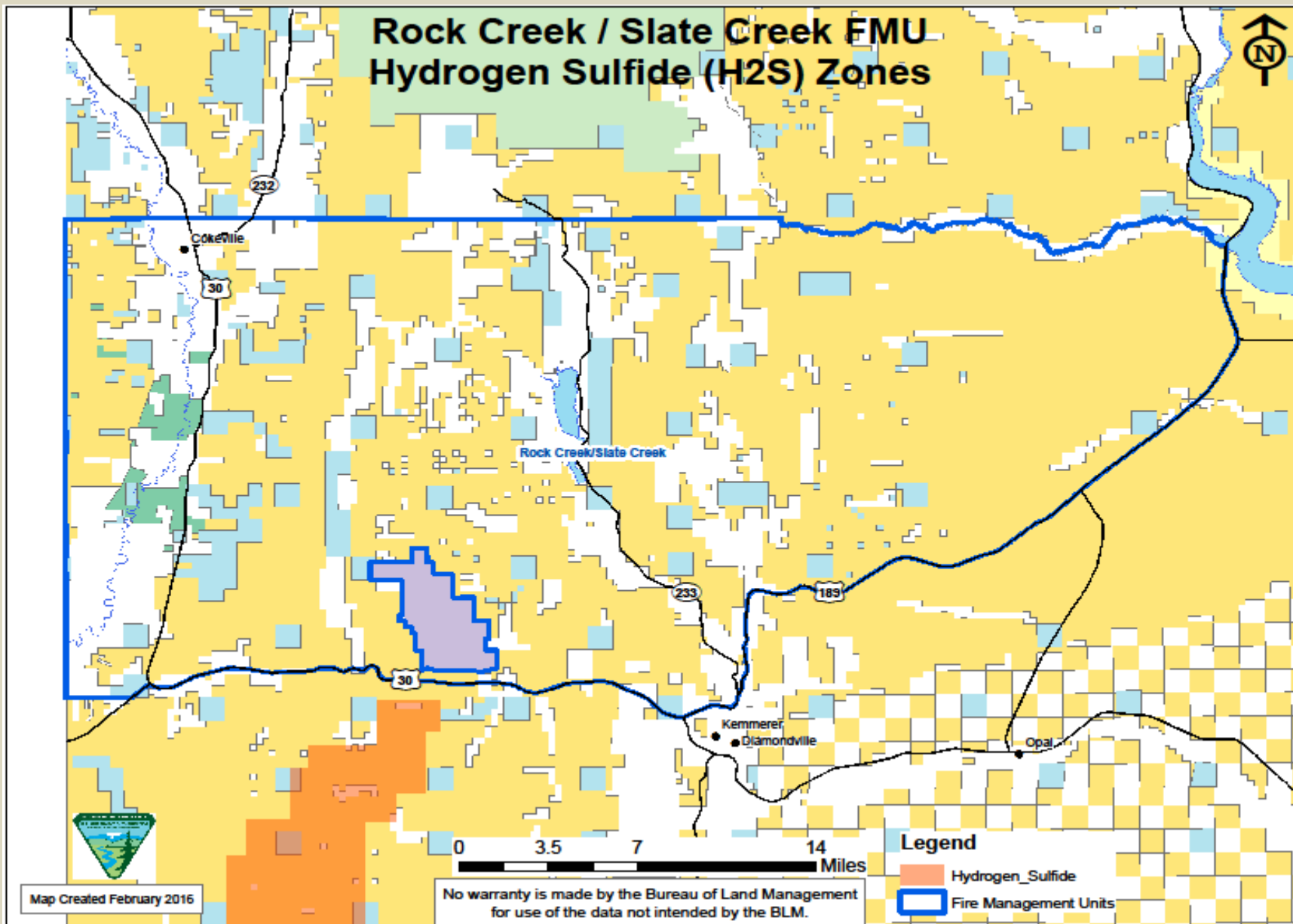


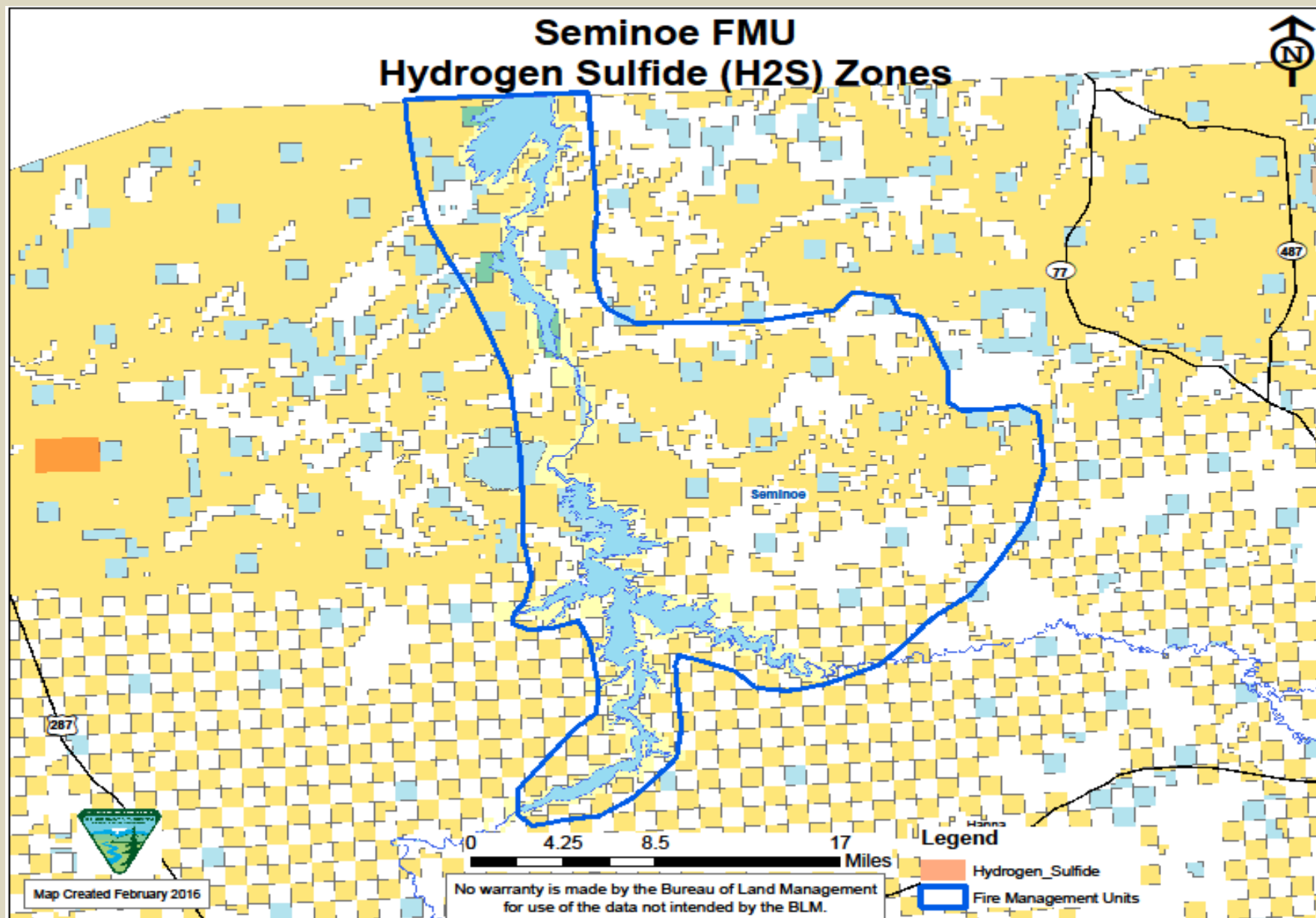




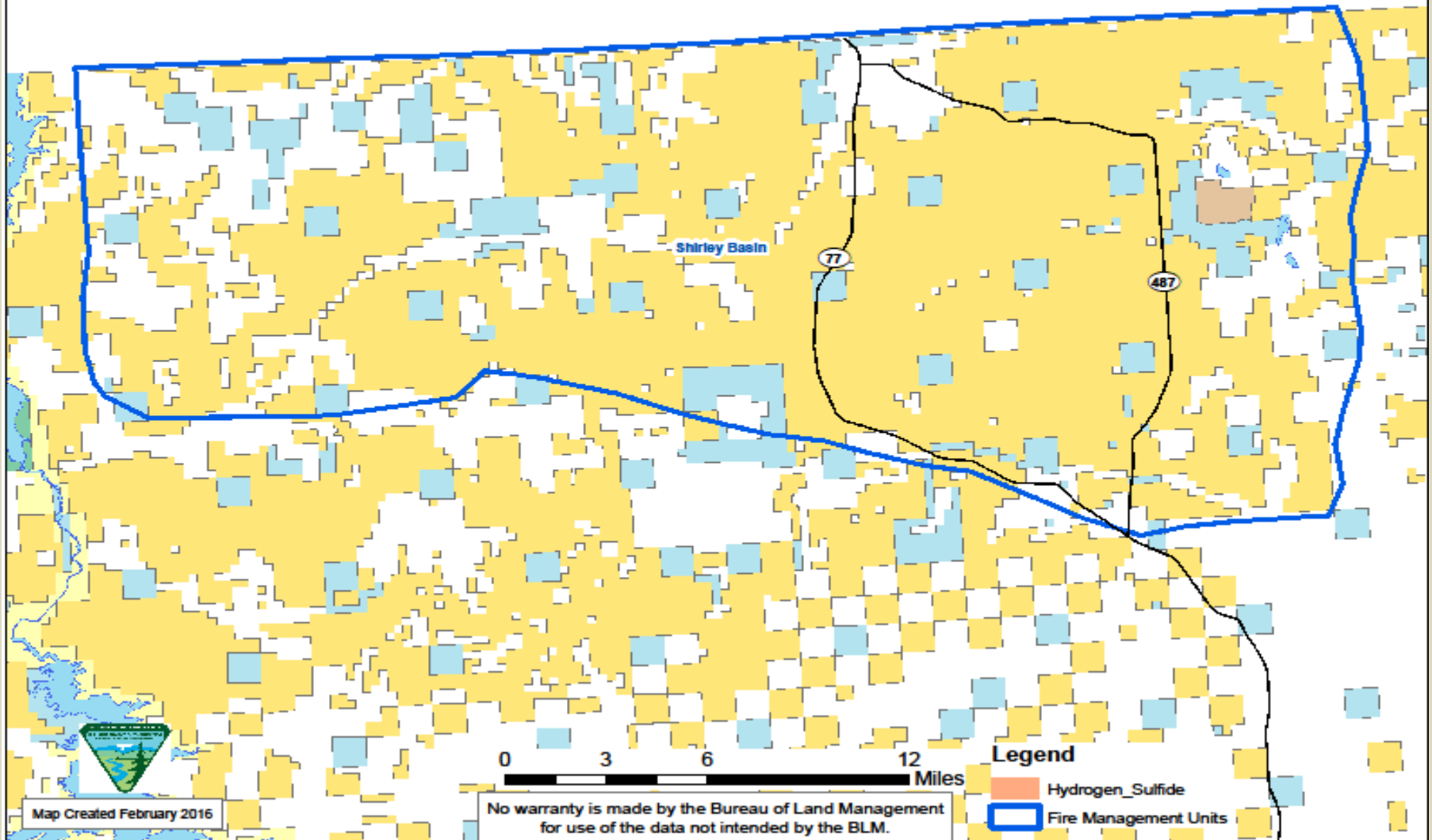


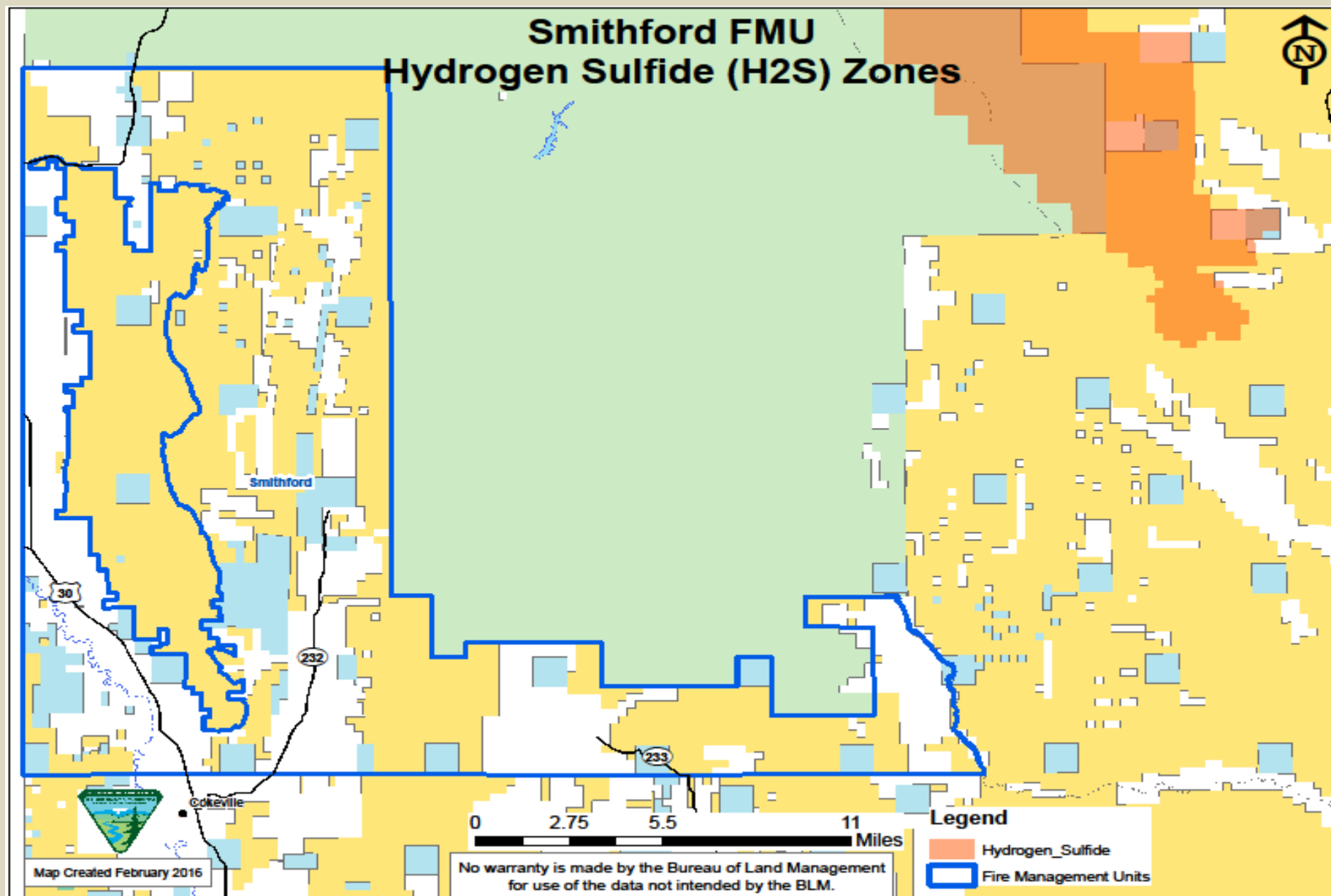


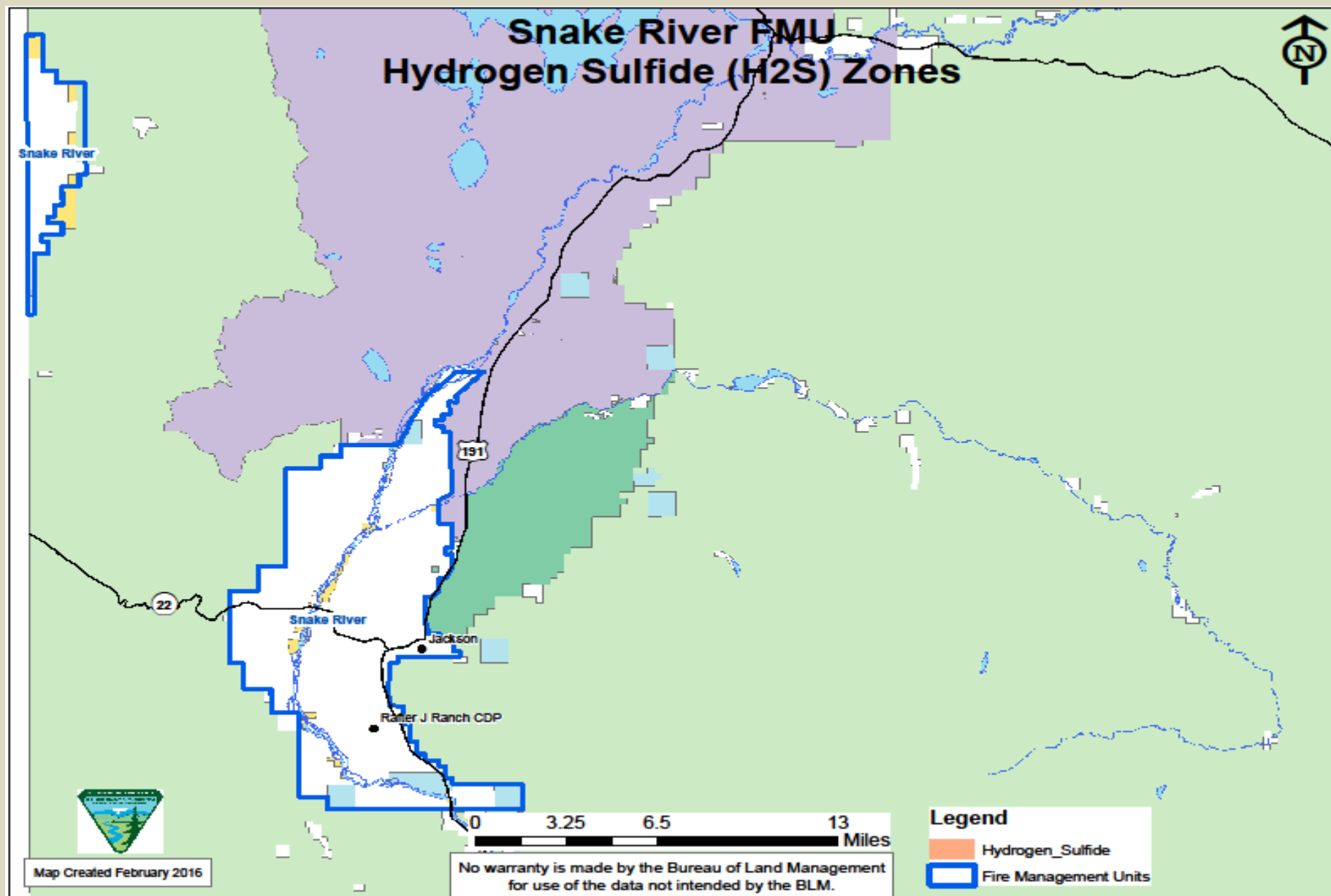


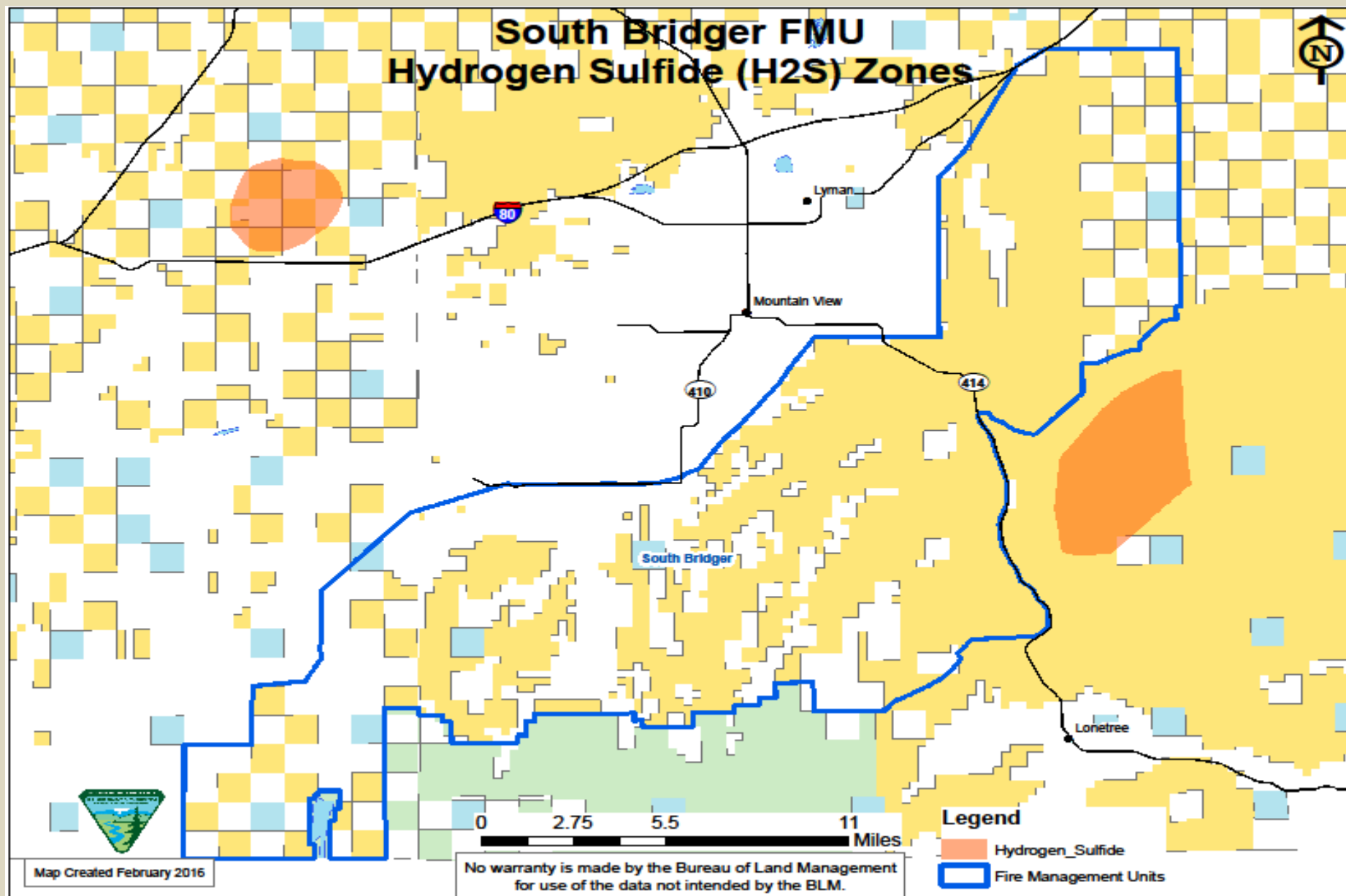


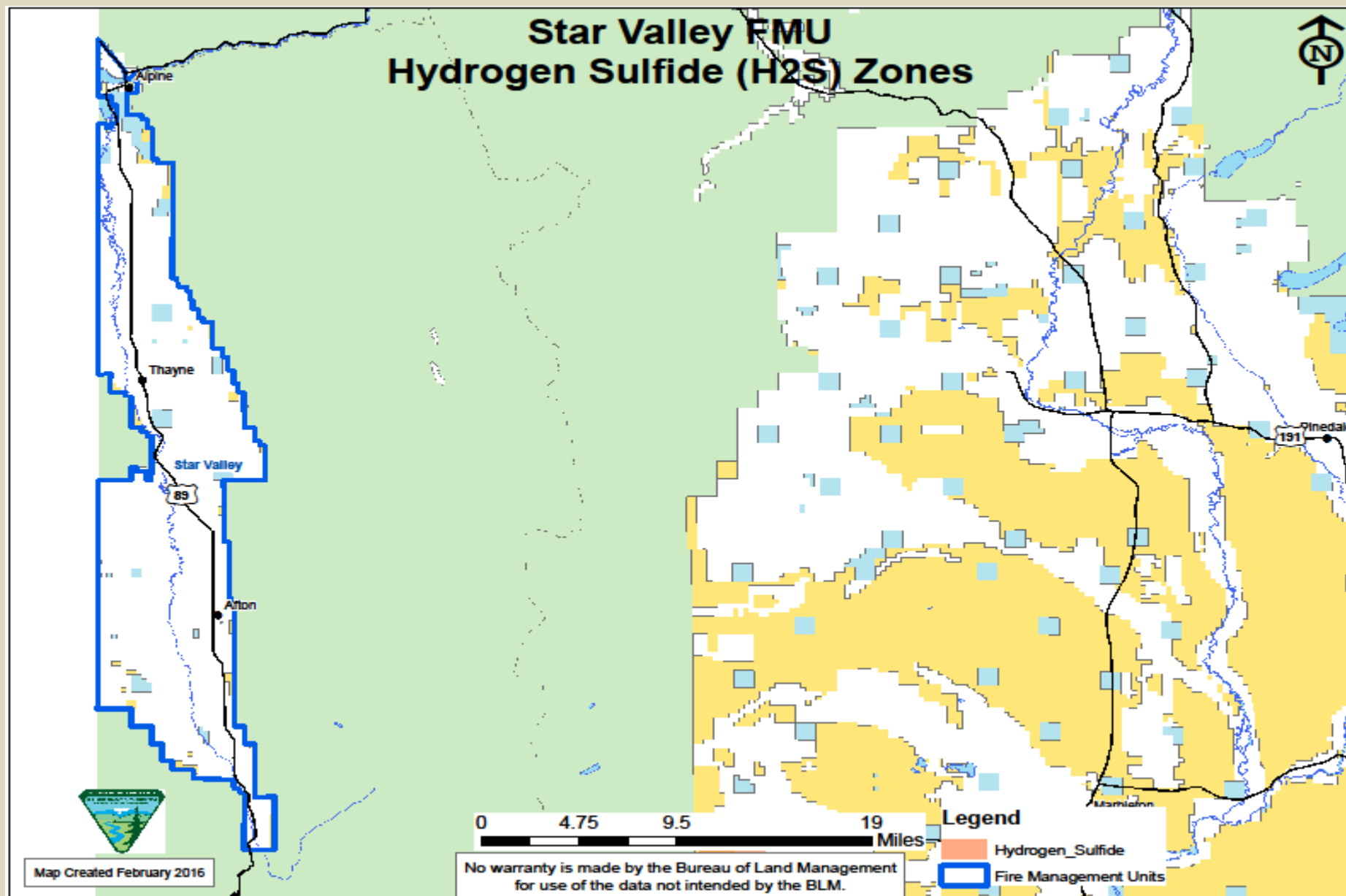
Shirley Basin FMU Hydrogen Sulfide (H₂S) Zones

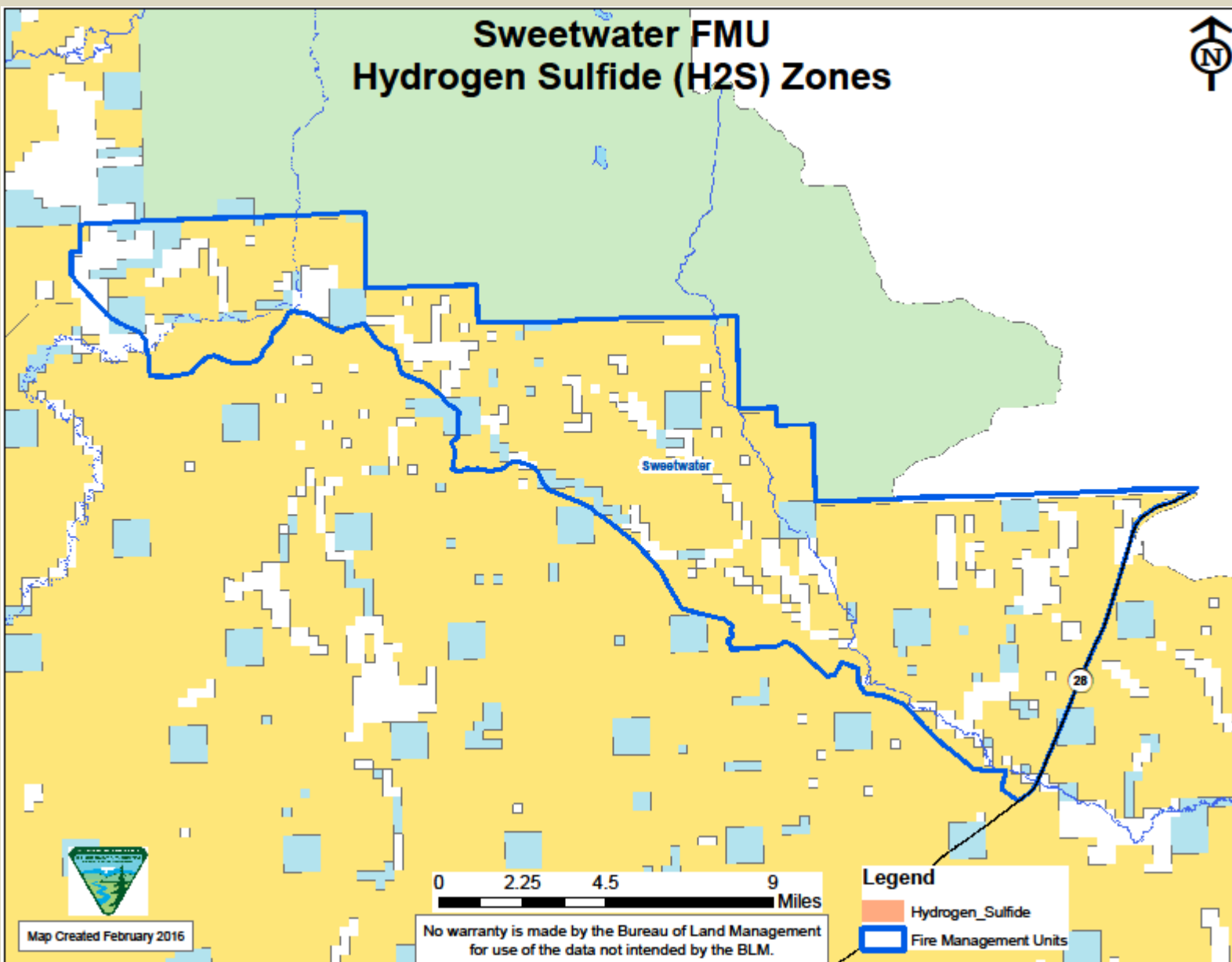


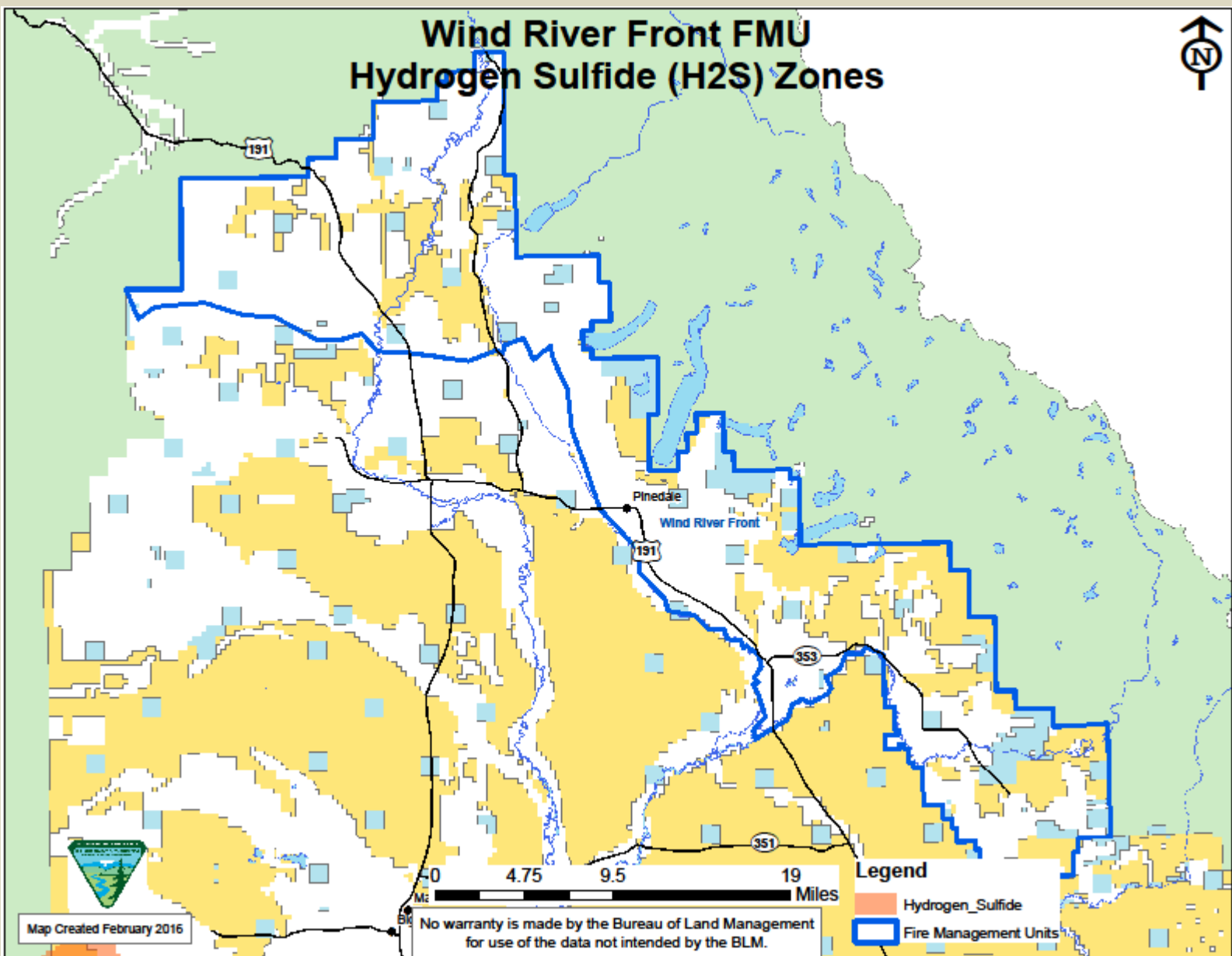


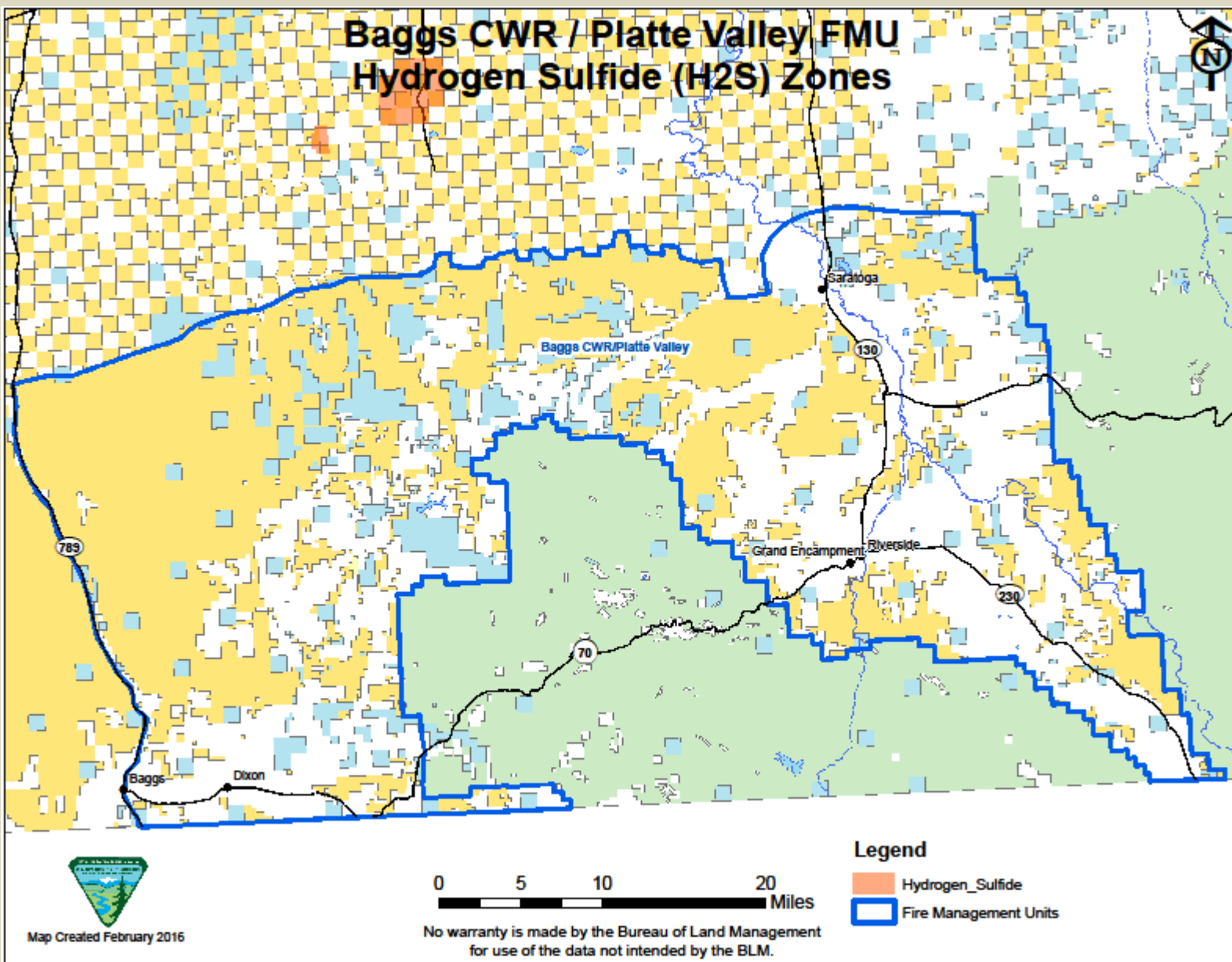


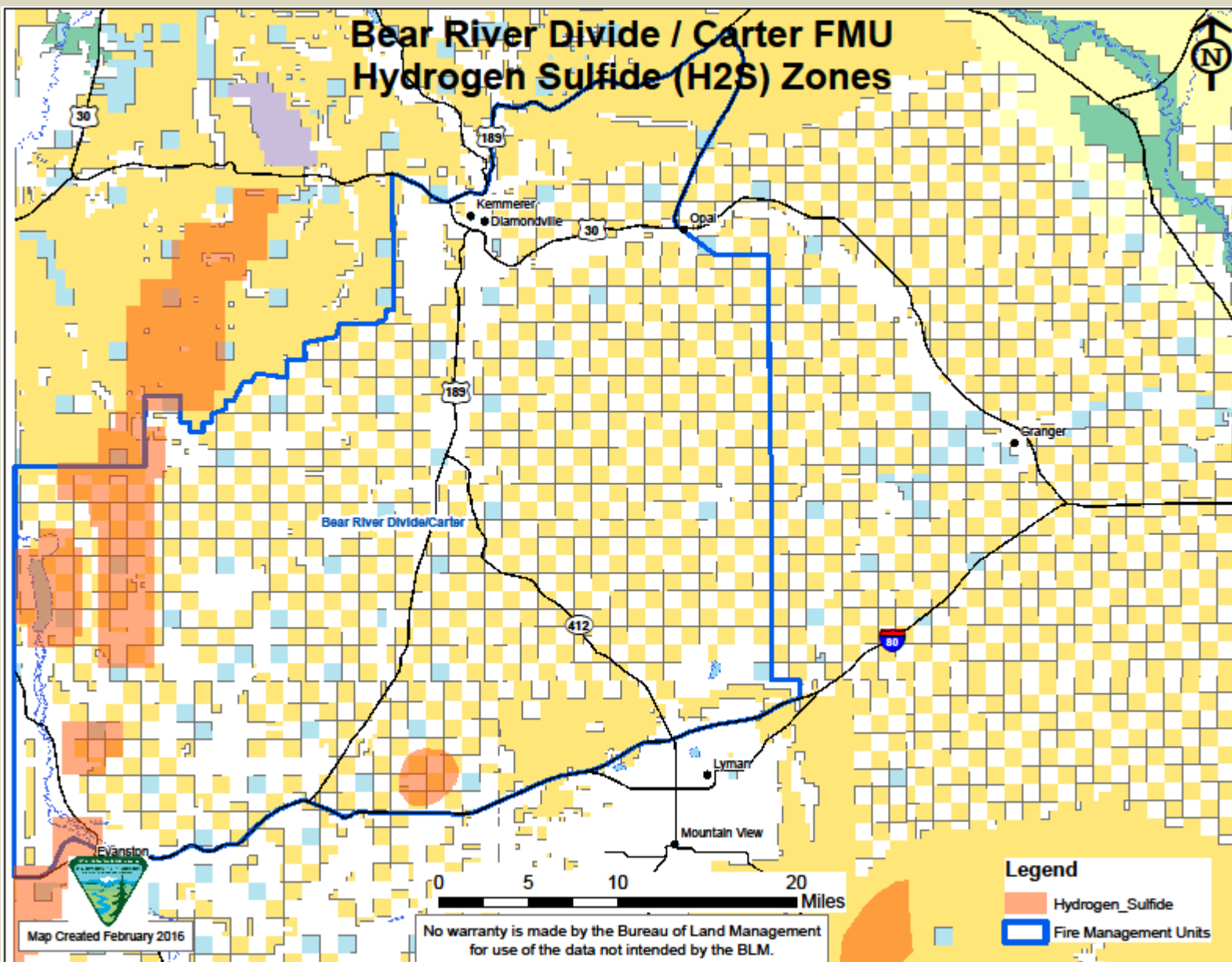


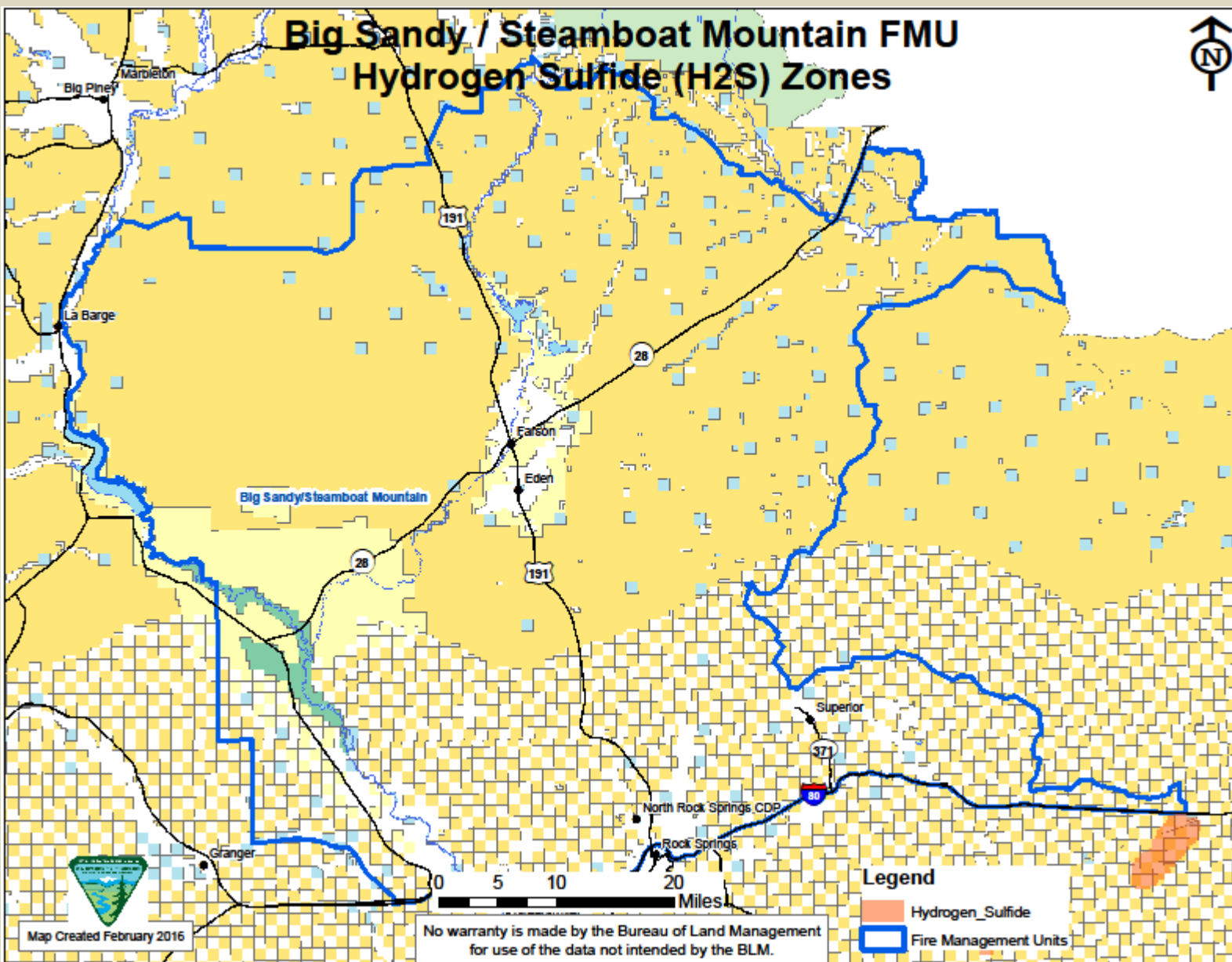




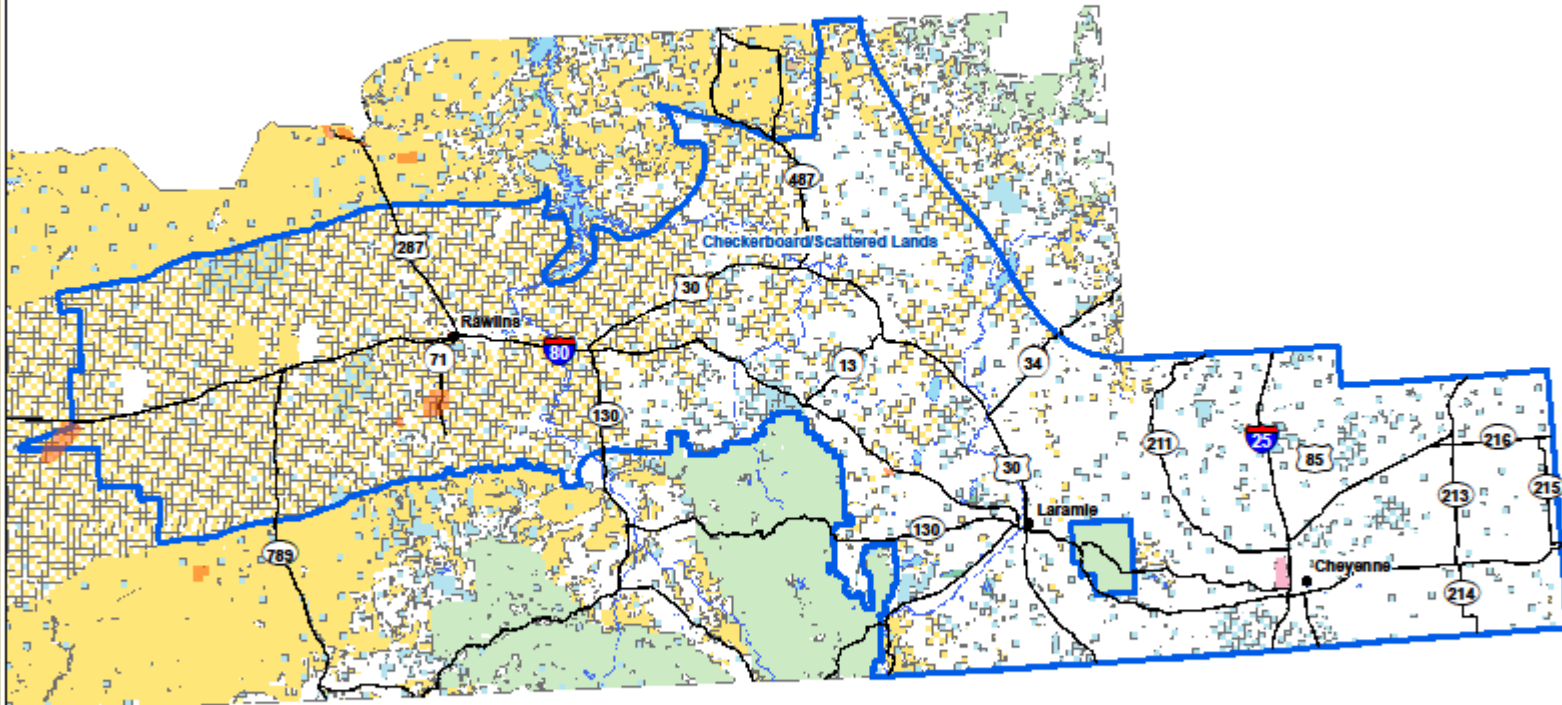








Checkerboard / Scattered Lands FMU Hydrogen Sulfide (H₂S) Zones



Map Created February 2016

0 15 30 60 Miles

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Legend

- Hydrogen_Sulfide
- Fire Management Units

